TCEQ Interoffice Memorandum

To: Tony Walker

Director, TCEQ Region 4, Dallas/Fort Worth

Alyssa Taylor

Special Assistant to the Regional Director, TCEQ Region 4, Dallas/Fort Worth

From: Heather Reddick Schaefer, DrPH HR

Toxicology Division, Office of the Executive Director

Date: May 5, 2017

Subject: Toxicological Evaluation of Results from an Ambient Air Sample for Volatile Organic Compounds Collected downwind of XTO Energy Inc., Props Findley D Pad (Latitude 32.48475, Longitude -97.72304) near Granbury, Hood County, Texas

Sample Collected on March 21, 2017, Request Number 1703007M1 (Lab Sample 1703007-001)

Key Points

- Reported concentrations of target volatile organic compounds (VOCs) were either not detected or were detected below levels of short-term health and/or welfare concern.
- The estimated monitored concentrations of 2-methylpentane (560 ppb_v), 3-methylpentane (330 ppb_v), benzene (47 ppb_v), cyclohexane (220 ppb_v), methylcyclopentane (180 ppb_v), and n-hexane (870 ppb_v) in the downwind sample (Lab Sample 1703007-0001) did not exceed the short-term, health AMCV, but are considered elevated above typical background concentrations and could potentially contribute to an elevated long-term (i.e., lifetime) cumulative exposure level.

Background

On March 21, 2017, a Texas Commission on Environmental Quality (TCEQ) Region 4 air investigator collected a 30-minute canister sample (Lab Sample 1703007-001) downwind of XTO Energy Inc., Props Findley D Pad near Granbury, Hood Texas (Latitude 32.48475, Longitude -97.72304). The sample was collected in response to a citizen complaint of shortness of breath, joint pain, dizziness, sore throat, tremors, high levels of benzene/styrene in blood, nose bleeds, insomnia, difficulty concentrating and a sweet, trash/sewage, propane odor. The investigator experienced burning of the eyes and dizziness and a strong, sweet, astringent/exhaust odor. Meteorological conditions measured at the site or nearest stationary ambient air monitoring site indicated that the ambient temperature was 84°F with a relative humidity of 42%, and winds were from the south southeast (170°) at 2.7-4.1 miles per hour. The sampling site was less than 100 feet from the possible emission sources. The nearest location where the public could have access was greater than 501 feet from the possible emission source

(tanks). The sample was sent to the TCEQ laboratory in Austin, Texas, and analyzed for a range of VOCs. The list of the target analytes that were evaluated in this review is provided in Attachment A. The VOC concentrations were reported in parts per billion by volume (ppbv) (Attachment B and Table 1). Please note that the available canister technology and analysis method cannot capture and/or analyze for all chemicals.

Results and Evaluation

Reported VOC concentrations were compared to TCEQ's short-term health- and/or welfare-based air monitoring comparison values (AMCVs) (Table 1). Short-term AMCVs are guidelines used to evaluate ambient concentrations of a chemical in air and to determine its potential to result in adverse health effects, adverse vegetative effects, or odors. Health AMCVs are set to provide a margin of safety and are set well below levels at which adverse health effects are reported in the scientific literature. If a chemical concentration in ambient air is less than its comparison value, no adverse health effects are expected to occur. If a chemical concentration exceeds its comparison value it does not necessarily mean that adverse effects will occur, but rather that further evaluation is warranted.

All of the 84 VOCs were either not detected or were detected below their respective short-term AMCVs. Exposure to levels of VOCs measured in this sample would not be expected to cause short-term adverse health effects, adverse vegetative effects, or odors.

The TD also recognizes that the estimated monitored concentrations of 2-methylpentane (560 ppb_v), 3-methylpentane (330 ppb_v), benzene (47 ppb_v), cyclohexane (220 ppb_v), methylcyclopentane (180 ppb_v), and n-hexane (870 ppb_v) in the downwind sample (Lab Sample 1703007-001) did not exceed respective short-term, health AMCVs and are below a level of short-term health concern, but are considered elevated above typical background concentrations. Although the monitored concentrations of the chemicals listed above are not a short-term health concern, an elevated short-term level may potentially contribute to an elevated long-term (i.e., lifetime) cumulative exposure.

Please call me at (512) 239-0154 if you have any questions regarding this evaluation.

Attachment A

List of Target Analytes for Canister Samples

ethane	4-methyl-1-pentene	t-1,3-dichloropropylene
ethylene	1,1-dichloroethane	1,1,2-trichloroethane
acetylene	cyclopentane	2,3,4-trimethylpentane
propane	2,3-dimethylbutane	toluene
propylene	2-methylpentane	2-methylheptane
dichlorodifluoromethane	3-methylpentane	3-methylheptane
methyl chloride	2-methyl-1-pentene + 1-hexene	1,2-dibromoethane
isobutane	n-hexane	n-octane
vinyl chloride	chloroform	tetrachloroethylene
1-butene	t-2-hexene	chlorobenzene
1,3-butadiene	c-2-hexene	ethylbenzene
n-butane	1,2-dichloroethane	m & p-xylene
t-2-butene	methylcyclopentane	styrene
bromomethane	2,4-dimethylpentane	1,1,2,2-tetrachloroethane
c-2-butene	1,1,1-trichloroethane	o-xylene
3-methyl-1-butene	benzene	n-nonane
isopentane	carbon tetrachloride	isopropylbenzene
trichlorofluoromethane	cyclohexane	n-propylbenzene
1-pentene	2-methylhexane	m-ethyltoluene
n-pentane	2,3-dimethylpentane	p-ethyltoluene
isoprene	3-methylhexane	1,3,5-trimethylbenzene
t-2-pentene	1,2-dichloropropane	o-ethyltoluene
1,1-dichloroethylene	trichloroethylene	1,2,4-trimethylbenzene
c-2-pentene	2,2,4-trimethylpentane	n-decane
methylene chloride	2-chloropentane	1,2,3-trimethylbenzene
2-methyl-2-butene	n-heptane	m-diethylbenzene
2,2-dimethylbutane	c-1,3-dichloropropylene	p-diethylbenzene
cyclopentene	methylcyclohexane	n-undecane

Attachment B

5/2/2017

Texas Commission on Environmental Quality
Laboratory and Quality Assurance Section
P.O. Box 13087, MC-165
Austin, Texas 78711-3087
(512) 239-1716

Laboratory Analysis Results
Request Number: 1703007M1

Request Lead:Frank Martinez Region: T04 Date Received: 3/24/2017
Project(s): Barnett Shale

Facility(ies) Sampled	City	County	Facility Type
XTO Energy Inc, Props Findley D Pad	Granbury	Hood	

Sample(s) Received

Field ID Number: N9129-102-0317 Laboratory Sample Number: 1703007-001 Sampled by: Megan Horton
Sampling Site: Date & Time Sampled: 03/21/17 15:07:00 Valid Sample: Yes
Comments: Canister N9129 was used to collect a 30-minute sample using OFC-102.
Note: This report was originally issued on 04/20/17. This report is being reissued on 05/02/17 to change the concentration of t-1,3-dichloropropylene from 8.80 ppbv to 0.0 ppbv (Non detected).

Requested Laboratory Procedure(s):

Analysis: AP001VOC
Determination of VOCs in Canisters by GC/MS Using Modified Method TO-15

Please note that this analytical technique is not capable of measuring all compounds which might have adverse health effects. For questions on the analytical procedures please contact the laboratory manager at (512) 239-1716. For an update on the health effects evaluation of these data, please contact the Toxicology Division at (512) 239-1795.

Analyst: A Mathew Date: 5/2/17
Anita Mathew

Laboratory Manager: Frank Martinez Date: 5/2/17
Frank Martinez

Laboratory Analysis Results

Request Number: 1703007M1

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1703007-001									
Field ID	N9129-102-0317									
Canister ID	N9129									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
ethane	52000	540	1300	3/29/2017	T,D3					
ethylene	ND	1.0	2.4	4/4/2017	T,D1					
acetylene	ND	1.0	2.4	4/4/2017	T,D1					
propane	18000	540	1300	3/29/2017	T,D3					
propylene	ND	1.0	2.4	4/4/2017	T,D1					
dichlorodifluoromethane	0.45	0.40	1.2	4/4/2017	L,D1					
methyl chloride	0.73	0.40	1.2	4/4/2017	L,D1					
isobutane	2300	250	1300	3/29/2017	D3					
vinyl chloride	ND	0.34	1.2	4/4/2017	D1					
1-butene	ND	0.40	1.2	4/4/2017	D1					
1,3-butadiene	ND	0.54	1.2	4/4/2017	D1					
n-butane	4900	210	1300	3/29/2017	D3					
t-2-butene	ND	0.36	1.2	4/4/2017	D1					
bromomethane	0.13	0.54	1.2	4/4/2017	J,D1					
c-2-butene	ND	0.54	1.2	4/4/2017	D1					
3-methyl-1-butene	ND	0.46	1.2	4/4/2017	D1					
isopentane	1800	22	190	4/6/2017	D6					
trichlorofluoromethane	0.17	0.58	1.2	4/4/2017	J,D1					
1-pentene	ND	0.54	1.2	4/4/2017	D1					
n-pentane	2200	22	190	4/6/2017	D6					
isoprene	ND	0.54	1.2	4/4/2017	D1					
t-2-pentene	ND	0.54	2.4	4/4/2017	D1					
1,1-dichloroethylene	ND	0.36	1.2	4/4/2017	D1					
c-2-pentene	ND	0.50	2.4	4/4/2017	D1					
methylene chloride	ND	0.28	1.2	4/4/2017	D1					
2-methyl-2-butene	ND	0.46	1.2	4/4/2017	D1					
2,2-dimethylbutane	36	4.2	12	3/29/2017	D5					
cyclopentene	ND	0.40	1.2	4/4/2017	D1					
4-methyl-1-pentene	ND	0.44	2.4	4/4/2017	D1					
1,1-dichloroethane	ND	0.38	1.2	4/4/2017	D1					
cyclopentane	51	5.4	12	3/29/2017	D5					
2,3-dimethylbutane	68	5.6	24	3/29/2017	D5					
2-methylpentane	560	22	49	4/6/2017	D6					
3-methylpentane	330	9.3	24	4/4/2017	D2					
2-methyl-1-pentene + 1-hexene	ND	0.40	4.8	4/4/2017	D1					
n-hexane	870	16	97	4/6/2017	D6					
chloroform	ND	0.42	1.2	4/4/2017	D1					
t-2-hexene	ND	0.54	2.4	4/4/2017	D1					
c-2-hexene	ND	0.54	2.4	4/4/2017	D1					
1,2-dichloroethane	ND	0.54	1.2	4/4/2017	D1					
methylcyclopentane	180	5.4	24	3/29/2017	D5					
2,4-dimethylpentane	33	5.4	24	3/29/2017	D5					
1,1,1-trichloroethane	ND	0.52	1.2	4/4/2017	D1					
benzene	47	5.4	12	3/29/2017	D5					
carbon tetrachloride	0.07	0.54	1.2	4/4/2017	J,D1					
cyclohexane	220	9.7	24	4/4/2017	D2					
2-methylhexane	280	11	24	4/4/2017	D2					
2,3-dimethylpentane	59	5.2	12	3/29/2017	D5					

Laboratory Analysis Results

Request Number: 1703007M1

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1703007-001									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
3-methylhexane	290	8.1	24	4/4/2017	D2					
1,2-dichloropropane	1.5	0.34	1.2	4/4/2017	D1					
trichloroethylene	ND	0.58	1.2	4/4/2017	D1					
2,2,4-trimethylpentane	ND	0.48	1.2	4/4/2017	D1					
2-chloropentane	ND	0.54	1.2	4/4/2017	D1					
n-heptane	510	20	97	4/6/2017	D6					
c-1,3-dichloropropylene	ND	0.40	1.2	4/4/2017	D1					
methylcyclohexane	330	10	48	4/4/2017	D2					
t-1,3-dichloropropylene	ND	0.40	1.2	4/4/2017	M,D1					
1,1,2-trichloroethane	ND	0.42	1.2	4/4/2017	D1					
2,3,4-trimethylpentane	1.5	0.48	2.4	4/4/2017	L,D1					
toluene	120	5.4	12	3/29/2017	D5					
2-methylheptane	170	4.0	24	3/29/2017	D5					
3-methylheptane	100	4.6	24	3/29/2017	D5					
1,2-dibromoethane	ND	0.40	1.2	4/4/2017	D1					
n-octane	180	3.8	24	3/29/2017	D5					
tetrachloroethylene	ND	0.48	1.2	4/4/2017	D1					
chlorobenzene	ND	0.54	1.2	4/4/2017	D1					
ethylbenzene	4.6	0.54	2.4	4/4/2017	D1					
m & p-xylene	61	1.1	9.6	4/11/2017	D4					
styrene	ND	0.54	2.4	4/4/2017	D1					
1,1,2,2-tetrachloroethane	ND	0.40	1.2	4/4/2017	D1					
o-xylene	10	0.54	2.4	4/4/2017	D1					
n-nonane	26	4.4	12	3/29/2017	D5					
isopropylbenzene	ND	0.48	1.2	4/4/2017	D1					
n-propylbenzene	0.56	0.54	1.2	4/4/2017	L,D1					
m-ethyltoluene	1.9	0.22	1.2	4/4/2017	D1					
p-ethyltoluene	0.75	0.32	2.4	4/4/2017	L,D1					
1,3,5-trimethylbenzene	3.1	0.50	2.4	4/4/2017	D1					
o-ethyltoluene	0.42	0.26	2.4	4/4/2017	L,D1					
1,2,4-trimethylbenzene	3.5	0.54	1.2	4/4/2017	D1					
n-decane	5.5	0.54	2.4	4/4/2017	D1					
1,2,3-trimethylbenzene	ND	0.54	1.2	4/4/2017	D1					
m-diethylbenzene	ND	0.54	2.4	4/4/2017	D1					
p-diethylbenzene	0.19	0.54	1.2	4/4/2017	J,D1					
n-undecane	0.40	0.54	2.4	4/4/2017	J,D1					

Laboratory Analysis Results

Request Number: 1703007M1

Analysis Code: AP001VOC

Qualifier Notes:

ND - not detected
NQ - concentration can not be quantified due to possible interferences or coelutions.
SDL - Sample Detection Limit (Limit of Detection adjusted for dilutions).
SQL - Sample Quantitation Limit (Limit of Quantitation adjusted for dilution).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T- Data was not confirmed by a confirmational analysis. Compound and/or results is tentatively identified.
F - Established acceptance criteria was not met due to factors outside the laboratory's control.
H - Not all associated hold time specifications were met. Data may be biased.
C - Sample received with a missing or broken custody seal.
R - Sample received with a missing or incomplete chain of custody.
I - Sample received without a legible unique identifier.
G - Sample received in an improper container.
U - Sample received with insufficient sample volume.
W - Sample received with insufficient preservation.

Quality control notes for AP001 VOC samples.

D1-Sample concentration was calculated using a dilution factor of 4.02.
D2-Sample concentration was calculated using a dilution factor of 80.66.
D3-Sample concentration was calculated using a dilution factor of 2141.62.
D4-Sample concentration was calculated using a dilution factor of 8.04.
D5-Sample concentration was calculated using a dilution factor of 40.13.
D6-Sample concentration was calculated using a dilution factor of 162.12.

TCEQ laboratory customer support may be reached at Frank.Martinez@tceq.texas.gov

Table 1. Comparison of Monitored Concentrations in Lab Sample 1703007-001 to TCEQ Short-Term AMCVs

Lab Sample ID	1703007-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
1,1,1-Trichloroethane	--	1,700	1.2	ND	D1	0.52
1,1,2,2-Tetrachloroethane	--	10	1.2	ND	D1	0.4
1,1,2-Trichloroethane	--	100	1.2	ND	D1	0.42
1,1-Dichloroethane	--	1,000	1.2	ND	D1	0.38
1,1-Dichloroethylene	--	180	1.2	ND	D1	0.36
1,2,3-Trimethylbenzene	--	3000	1.2	ND	D1	0.54
1,2,4-Trimethylbenzene	--	3000	1.2	3.5	D1	0.54
1,2-Dibromoethane	--	0.5	1.2	ND	D1	0.4
1,2-Dichloroethane	--	540	1.2	ND	D1	0.54
1,2-Dichloropropane	--	100	1.2	1.5	D1	0.34
1,3,5-Trimethylbenzene	--	3000	2.4	3.1	D1	0.5
1,3-Butadiene	230	1,700	1.2	ND	D1	0.54
1-Butene	--	27,000	1.2	ND	D1	0.4
1-Pentene	100	12,000	1.2	ND	D1	0.54
2,2,4-Trimethylpentane	--	4,100	1.2	ND	D1	0.48
2,2-Dimethylbutane (Neohexane)	--	1,000	12	36	D5	4.2
2,3,4-Trimethylpentane	--	4,100	2.4	1.5	L,D1	0.48
2,3-Dimethylbutane	--	990	24	68	D5	5.6
2,3-Dimethylpentane	--	8,300	12	59	D5	5.2
2,4-Dimethylpentane	--	8,300	24	33	D5	5.4
2-Chloropentane (as chloroethane)	--	240	1.2	ND	D1	0.54
2-Methyl-1-Pentene +1-Hexene	--	490	4.8	ND	D1	0.4
2-Methyl-2-Butene	--	12,000	1.2	ND	D1	0.46
2-Methylheptane	--	4,100	24	170	D5	4
2-Methylhexane	--	8,300	24	280	D2	11

Lab Sample ID	1703007-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
2-Methylpentane (Isohexane)	--	990	49	560	D6	22
3-Methyl-1-Butene	100	7,700	1.2	ND	D1	0.46
3-Methylheptane	--	4,100	24	100	D5	4.6
3-Methylhexane	--	8,300	24	290	D2	8.1
3-Methylpentane	--	1,000	24	330	D2	9.3
4-Methyl-1-Pentene (as hexene)	--	490	2.4	ND	D1	0.44
Acetylene	--	25,000	2.4	ND	T,D1	1
Benzene	--	180	12	47	D5	5.4
Bromomethane (methyl bromide)	--	30	1.2	0.13	J,D1	0.54
c-1,3-Dichloropropylene	--	9.9	1.2	ND	D1	0.4
c-2-Butene	--	15,000	1.2	ND	D1	0.54
c-2-Hexene	--	490	2.4	ND	D1	0.54
c-2-Pentene	--	12,000	2.4	ND	D1	0.5
Carbon Tetrachloride	--	20	1.2	0.07	J,D1	0.54
Chlorobenzene (phenyl chloride)	--	100	1.2	ND	D1	0.54
Chloroform (trichloromethane)	--	20	1.2	ND	D1	0.42
Cyclohexane	--	1,000	24	220	D2	9.7
Cyclopentane	--	5,900	12	51	D5	5.4
Cyclopentene	--	2,900	1.2	ND	D1	0.4
Dichlorodifluoromethane	--	10,000	1.2	0.45	L,D1	0.4
Ethane	--	*Simple Asphyxiant	1300	52000	T,D3	540
Ethylbenzene	--	20,000	2.4	4.6	D1	0.54
Ethylene	--	500,000	2.4	ND	T,D1	1
Isobutane	--	33,000	1300	2300	D3	250
Isopentane (2-methylbutane)	--	68,000	190	1800	D6	22
Isoprene	47	20	1.2	ND	D1	0.54

Lab Sample ID	1703007-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Isopropylbenzene (cumene)	130	510	1.2	ND	D1	0.48
m & p-Xylene (as mixed isomers)	--	1,700	9.6	61	D4	1.1
m-Diethylbenzene	--	450	2.4	ND	D1	0.54
Methyl Chloride (chloromethane)	--	500	1.2	0.73	L,D1	0.4
Methylcyclohexane	--	4,000	48	330	D2	10
Methylcyclopentane	--	750	24	180	D5	5.4
Methylene Chloride (dichloromethane)	--	3,400	1.2	ND	D1	0.28
m-Ethyltoluene	--	250	1.2	1.9	D1	0.22
n-Butane	--	92,000	1300	4900	D3	210
n-Decane	--	1,750	2.4	5.5	D1	0.54
n-Heptane	--	8,300	97	510	D6	20
n-Hexane	--	1,700	97	870	D6	16
n-Nonane	--	3,000	12	26	D5	4.4
n-Octane	--	4,100	24	180	D5	3.8
n-Pentane	--	68,000	190	2200	D6	22
n-Propylbenzene	--	510	1.2	0.56	L,D1	0.54
n-Undecane	--	550	2.4	0.4	J,D1	0.54
o-Ethyltoluene	--	250	2.4	0.42	L,D1	0.26
o-Xylene	--	1,700	2.4	10	D1	0.54
p-Diethylbenzene	--	450	1.2	0.19	J,D1	0.54
p-Ethyltoluene	--	250	2.4	0.75	L,D1	0.32
Propane	--	*Simple Asphyxiant	1300	18000	T,D3	540
Propylene	--	*Simple Asphyxiant	2.4	ND	T,D1	1
Styrene	26	5,200	2.4	ND	D1	0.54
t-1,3-Dichloropropylene	--	9.9	1.2	ND	M,D1	0.4
t-2-Butene	--	15,000	1.2	ND	D1	0.36

Lab Sample ID	1703007-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
t-2-Hexene	--	490	2.4	ND	D1	0.54
t-2-Pentene	--	12,000	2.4	ND	D1	0.54
Tetrachloroethylene	--	1,000	1.2	ND	D1	0.48
Toluene	--	4,000	12	120	D5	5.4
Trichloroethylene	--	100	1.2	ND	D1	0.58
Trichlorofluoromethane	--	10,000	1.2	0.17	J,D1	0.58
Vinyl Chloride	--	27,000	1.2	ND	D1	0.34

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.
ppbv - Parts per billion by volume.
ND - Not detected.
NQ - Concentration can not be quantified due to possible interferences or coelutions.
SDL - Sample Detection Limit (Limit of Detection adjusted for dilution).
SQL – Sample Quantitation Limit (Limit of Quantitation adjusted for dilution).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T - Data was not confirmed by a confirmational analysis. Data is tentatively identified.
F - Established acceptance criteria were not met due to factors outside the laboratory's control.
H – Not all associated hold time specifications were met. Data may be biased.
C - Sample received with a missing or broken custody seal.
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G - Sample received in an improper container.
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D1 - Sample concentration was calculated using a dilution factor of 4.02.

D2 - Sample concentration was calculated using a dilution factor of 80.66.
D3 - Sample concentration was calculated using a dilution factor of 2141.62.
D4 - Sample concentration was calculated using a dilution factor of 8.04.
D5-Sample concentration was calculated using a dilution factor of 40.13.
D6-Sample concentration was calculated using a dilution factor of 162.12.

Table 2. TCEQ Long-Term Air Monitoring Comparison Values (AMCVs)

Please Note: The long-term AMCVs are provided for informational purposes only because it is scientifically inappropriate to compare short-term monitored values to the long-term AMCV.

Compound	Long-Term Health AMCV (ppb_v)	Compound	Long-Term Health AMCV (ppb_v)
1,1,1-Trichloroethane	930	Cyclopentane	590
1,1,2,2-Tetrachloroethane	1	Cyclopentene	290
1,1,2-Trichloroethane	10	Dichlorodifluoromethane	1,000
1,1-Dichloroethane	100	Ethane	*Simple Asphyxiant
1,1-Dichloroethylene	86	Ethylbenzene	440
1,2,3-Trimethylbenzene	37	Ethylene**	5,300
1,2,4-Trimethylbenzene	37	Isobutane	10,000
1,2-Dibromoethane	0.05	Isopentane (2-methylbutane)	8,100
1,2-Dichloroethane	0.72	Isoprene	2
1,2-Dichloropropane	10	Isopropylbenzene (cumene)	51
1,3,5-Trimethylbenzene	37	m & p-Xylene (as mixed isomers)	140
1,3-Butadiene	9	m-Diethylbenzene	46
1-Butene	2300	Methyl Chloride (chloromethane)	50
1-Pentene	560	Methylcyclohexane	400
2,2,4-Trimethylpentane	380	Methylcyclopentane	75
2,2-Dimethylbutane (Neohexane)	100	Methylene Chloride (dichloromethane)	100
2,3,4-Trimethylpentane	380	m-Ethyltoluene	25
2,3-Dimethylbutane	99	n-Butane	10,000
2,3-Dimethylpentane	2,200	n-Decane	175
2,4-Dimethylpentane	2,200	n-Heptane	2,200
2-Chloropentane (as chloroethane)	24	n-Hexane	190
2-Methyl-1-Pentene +1-Hexene	49	n-Nonane	280

Compound	Long-Term Health AMCV (ppb_v)	Compound	Long-Term Health AMCV (ppb_v)
2-Methyl-2-Butene	560	n-Octane	380
2-Methylheptane	380	n-Pentane	8,100
2-Methylhexane	2,200	n-Propylbenzene	51
2-Methylpentane (Isohexane)	99	n-Undecane	55
3-Methyl-1-Butene	770	o-Ethyltoluene	25
3-Methylheptane	380	o-Xylene	140
3-Methylhexane	2,200	p-Diethylbenzene	45
3-Methylpentane	100	p-Ethyltoluene	25
4-Methyl-1-Pentene (as hexene)	49	Propane	*Simple Asphyxiant
Acetylene	2,500	Propylene	*Simple Asphyxiant
Benzene	1.4	Styrene	110
Bromomethane (methyl bromide)	3	t-1,3-Dichloropropylene	0.99
c-1,3-Dichloropropylene	0.99	t-2-Butene	700
c-2-Butene	700	t-2-Hexene	49
c-2-Hexene	49	t-2-Pentene	560
c-2-Pentene	560	Tetrachloroethylene***	3.8
Carbon Tetrachloride	2	Toluene	1,100
Chlorobenzene (phenyl chloride)	10	Trichloroethylene	10
Chloroform (trichloromethane)	2	Trichlorofluoromethane	1,000
Cyclohexane	100	Vinyl Chloride	0.47

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.
**Long-term vegetation AMCV for Ethylene is 30 ppb.
***Long-term vegetation AMCV for Tetrachloroethylene is 12 ppb.